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Associated Students of the Montana College of Mineral Science and Technology

MONTANA COLLEGE OF MINERAL SCIENCE & TECHNOLOGY — De Re Metallica

The AMPLIFIER

Montana College of Mineral Science and Technology

Vol. XII, No. 8 — BUTTE, MONTANA — Wednesday, April 5, 1967

Welcome to College Days

Amendment to raise activity fee passed

On March 7, Montana Tech voted on whether they wanted a student activity fee of $20.00 for each semester instead of the previous fee of $15.00. There were 250 students who voted yes for the new constitutional amendment and 42 students who voted no. Since 85.6% of the votes were yes, more than the required 2/3 vote, the new constitutional amendment was passed.

This issue was an example of better student support than has been shown before. A petition signed by 84 students at Montana Tech was handed in to bring this once defeated measure to another vote. Also, there was signs put up around the school urging students to support this issue. The way the students defended the measure at the A.S.M.T. Convocaiton showed a strong response to the appeals of the petitioning students.

A convocation, which was an open student council meeting, was held on March 6, 1967 to discuss the proposed raise in student activity fees.

President Koch attends workshop

President Edwin G. Koch is attending the ASCU How-To-Do-It Development Workshop in San Francisco. Conducted by the Association of State Colleges and Universities (ASCU), the workshop is being held in the Sheraton Palace Hotel, April 3-5.

Discussions during the workship concern methods of coordinating school development programs and their financial backing. Ways of securing public and private financial resources, as well as gifts and bequests, will be related to long-range planning for institutional development.

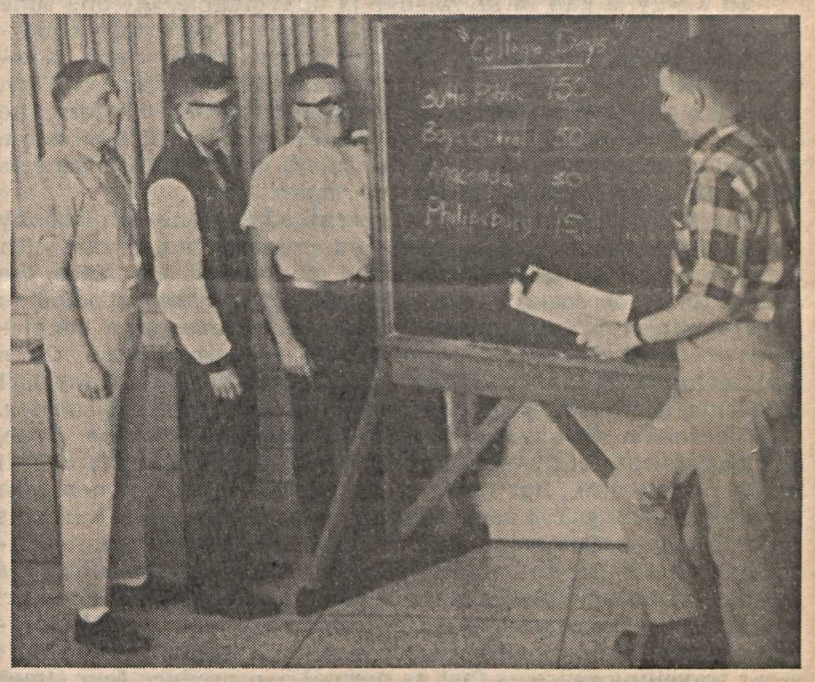
Circle K College Days start today

Plans for the 1967 edition of college days at Montana Tech are in full swing according to Dave Kneebone, chairman for the event. The Circle K club members are directors of the annual sessions, conducted to familiarize students of area high schools with Montana Tech.

About 150 students of Butte high school will attend the program on April 5. On April 7 students from Butte Central, Anaconda Central, Anaconda Public, Deer Lodge, Whitehall, Boulder and Philipsburg, About 80-90 students in all, will participate.

The program includes a lecture by Professor Frank Kelly, a lecture by a member of the English faculty, and a talk on college life by a member of the Circle K club. The participating high school students will also be given a chance to attend at least three college classes, and will be taken on tours of the campus visiting such points as the computer center. They will be given lunch by the club.

Besides Dave Kneebone, the general chairman, co-ordinators for the event are Boyd Williams, program; Tim Bass, class schedule; Joe Wallace, dance; Mike Chapman, refreshments.



Reviewig a few statistics and making plans for College Days are (left to right) Boyd Williams, Mike Chapman, Tim Bass, and chairman Dave Kneebone. (Photo by Jon Groff)

Fee raise produces strong controversy

Henry Scholz, president of the Student Council, called to order a convocation at 10:15 in the Student Union Building on March 6, 1967.

The convocation was held to present the issues for the March 7 vote on a fee raise of $5.00. This $5.00 increase in the activity fees would allow the school to have more student extracurricular activities such as mixers.

Henry asked for comments concerning the raise and a discussion was carried on by interested students. Of the students speaking, only two fought against the amendment while about 15 students were for it.

The main objection to the bill was that the issue had already been voted against once and therefore should not be brought up again. Those speaking for the issue, with full support from most of the students at the convocation, stated the main reasons for a raise, backing all suggestions with logical ideas. Student apathy towards the school was also discussed by many who felt that something must be done in order to build our school rather than let it be run down.

Because of lack of time, Henry dismissed the convocation at 11:10.

Montana Tech recently acquired a 20K storage unit and a printer for the computer center. The IBM 1623 storage unit, which was purchased from the South Dakota School of Mines, will almost triple the capacity of Tech's computer. The 2500 pound IBM 407 printer will greatly increase the speed of data output from the computer. Previously acquired earlier this year were a printing card punch and a card sorter. In the picture above, the printer is being lowered through a window near the computer center by a crane.

President Johnson announces draft changes to be made

President Johnson told Congress March 6 that he would seek to end unfairness in the draft by calling 19-year-olds first, establishing a random system of selection, and tightening of deferments. His Special Message on Selective Service came shortly after the release of the official report of his National Advisory Commission on Selective Service.

Although the President has not yet made a decision on undergraduate deferments, he will soon issue an executive order "specifying that no deferments for postgraduate study be granted in the future, except for those men pursuing medical and dental courses." Stating that some student deferments "have pyramided into exemptions from military service," the President added that "some young men have managed to pile deferment on deferment until they passed the normal cut-off time for induction."

Also, the President said he was ordering a random selection system, not yet planned in detail, to become operational before January 1, 1969. The system would probably operate in the following manner. At age 18, all men would be examined to determine their physical and mentail eligibility. All eligible men reaching age 9 before a designated date would be placed in a selection pool. A random system would then determine their order of call for that year. They would then be selected in that order to fill draft calls placed by the Department of Defense. Those not called during this period will drop to a position behind the following year's group of 19-year-olds. All men would remain eligible for the draft in diminishing order up to 26, in the event of a national emergency.

Those who had received deferments would be eligible until their 35th birthday.

The President also listed other actions he would take. He would direct the Secretary of Defense to develop a program of medical scholarships to attract more physicians, dentists, and other members of the health professions to volunteer for military service. Students accepting these scholarships would commit themselves to longer terms of service.

He would direct the Secretary of Defense to give priority to Reserve enlistees who are under 19 years of age to encourage a maximum number of volunteers who are not immediately draft liable. Reserve deferments for men over 19 will be authorized only to the extent required to fill specific vacancies in reserve units. In addition, he would recommend that Congress enact standby authority to allow the Department of Defense to draft men into Reserve and National Guard units whenever the authorized strength of these units cannot otherwise be maintained.

Although a decision has not yet been made concerning undergraduate deferments, the President's commission gave a majority decision to end these or occupational deferments with the following four exceptions:

1. Under appropriate regulations which will prevent abuses, students who are in school and men who are in recognized apprentice training when this plan goes into effect will be permitted to complete the degrees or programs for which they are candidates. When those deferments terminate, they will be placed in the selection pool with the 18-year-olds and their order of selection determined the following year as described for 19-year-olds.

2. Thereafter, men who are already in college when they are randomly selected for service will be allowed to complete their sophomore year before induction.

3. Men who enroll in officer training programs in college should be deferred, provided they agree to serve in the Armed Forces as enlisted men if they do not complete their officer programs.

4. Hardship deferments, which defy rigid classification but which

(continued on page 5)

Tech budget for 1967-69 is listed

For the 1967-68 school year, Montana Tech will have a budget of $1,311,500, a 28.2% increase over the $1,022,850 for the present school year. According to President Koch, the increase for the coming year will cover salary increases, additional faculty and staff, a slight increase in operations and equipment and $37,500 of special appropriations for the Bureau of Mines and Geology.

For the 1967-69 biennium, $2,553,500 was appropriated for Montana Tech, about $750,000 more than for the 1965-67 biennium. Much of the increase for the next two years will cover constantly rising operational costs due to inflation. Also included are special Bureau appropriations of $40,000 for coal research carried on by the Montana University System Coal Resources Research Council, $17,500 for Bureau groundwater research, and $21,000 for the Bureau-USGS co-operative groundwater program.

The appropriations for Montana Tech come from the General Fund, the University Millage Fund, and the Student Fee Account. To the appropriations are added the income from landgrant and miscellaneous sources for the total budget for the biennium. The total budget for the coming biennium will be about $2,711,500 (compared to $2,016,495 for the present biennium), of which $626,487 will be for operations of the Bureau of Mines and Geology (compared to $452,541 for the present biennium).

Texaco gives Tech $2,000 grant

Texaco, Inc. recently awarded Montana Tech a special aid-to-education grant of $2000.

The grant was presented at a luncheon by Norman G. Kittrell of Denver, the firm's division petroleum engineer, and George W. Taylor of Butte, district sales engineer for Montana.

Dr. Herbert Warren announced that the grant will be used to provide a portion of the funds necessary to acquire additional modern equipment for the natural gas laboratory of Tech's petroleum engineering department.

Dr. Edwin G. Koch said that "The willingness of Texaco, Inc. to provide further financial assistance to Montana Tech indicates the fine spirit of mutual cooperation that exists between the firm and the college. It is an expression of the esteem in which Texaco holds those of our alumni who are now employed by the company. We deeply appreciate this gesture as we do Texaco's continuing scholarship program at the college."

Who has the more complete education?

by STEVE BAUER

In this era of gap consciousness, when the missile gap and the credibility gap receive considerable attention, another gap is being studied — the education gap. There are basic differences that set it apart from the others and make its understanding more important.

In a way, a gap in knowledge is unavoidable. At one time in the past, it was possible for an intelligent person to understand a little of everything that was known at the time. However, in this technical age, the universal man is an impossibility. Although more people are better educated than ever before, the growth of technology has far outdistanced that of education. A person is forced to specialize, to spend more time on aspects of his field and less on unrelated topics.

From these pressures, our present educational philosophy has evolved. Although scientists and engineers must cope with the problems of the physical world, they must also face the demands of the social world. Therefore they are expected to have a minimum background in general courses as a supplement to their specialized training. On the other hand, these non-technical students are not expected to deal with physical problems, there is no reason for them to take technical courses.

There is a serious error in the last bit of reasoning. True, a scientists cannot divorce himself from the real world and still live a normal life. But neither can the average person live in ignorance of physical concepts that help shape his life in this technical age. The writings of Plato may help a technically-trained person to understand the world he lives in, but it is not likely that he will ever have to recall any point in particular. Although the concepts of physics may be difficult for the average person to grasp or remember, wouldn't the knowledge that a car travelling twice as fast as normal can produce four times as much destructive energy be useful? Certainly he is as susceptible to the physical laws of our world as is the scientist.

General courses of study should therefore be supplemented with meaningful courses in science and mathematics. Certainly they would not have to be as rigorous as those taken by engineering students. The important point is to establish a familiarity with the basic features of technical fields in order to keep pace with technological changes in our society.

Under the present system, only a scientist can understand a technological innovation and its social implications. Unfortunately, leaders are rarely scientists. Unless the goals of edcuation are changed, we will experience more probelms like those we had with the advent of nuclear energy.

Tech's future may depend on student initiative in recruiting new students

What will Montana Tech be in 1975? Will it be the greatest mineral science college in the world or Buttaconda Junior College? Both possibilities exist. If in 1975 our cost per student is $350 more than at any other state supported college, if we have over 50% general students, and if 68% of the students are from Silver Bow County, we will be non-existent or at best a junior college. The people of Montana could not afford to continue to support a state college like that described with the above, but those statistics apply to Montana Tech today.

Fortunately we still exist, but during the last legislative session an unsuccessful attempt on our life was made. We have to bring the above statistics to a par with the other state supported colleges. The only practical way is to increase the engineering student enrollment.

Any significant increase in engineering students must come from other areas of Montana — Billings, Great Falls, Missoula, etc. But to increase the enrollment means that the prospective students must be convinced that they should come to Montana Tech and not the UM or MSU. The administration is doing all it can to recruit new students, but student help is needed. Did you come to Montana Tech just because you read a pamplet describing the school, or was it because you read about the football team in the newspaper, or was it because a friend, a student at Montana Tech, convinced you to come?

If Montana Tech is to have an enrollment of 2,000 by 1975 as suggested by the alumni, we are going to have to expand our existing programs such as E-Days and College Days to include out of town students. Just as important, each of us will have to do his own personal recruiting. I have found that an effective method to recruit is to go to my former high school and personally speak to the students interested in mineral science and engineering. The high school college advisor has been more than happy to tell me who is interested in these fields. This personal contact may mean the difference in whether a student goes to Montana Tech or to Podunk U.

PETE KNUDSEN,
Junior Class President

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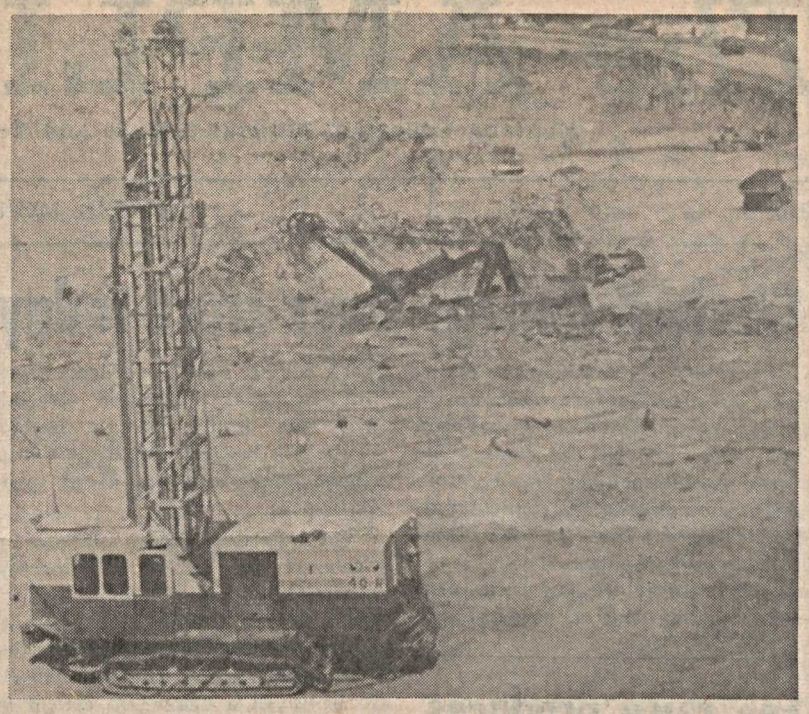


Larger, more efficient equipment enables the mining engineer to plan on a larger scale. Shown is a rotary blast-hole drill in the Berkeley Pit with shovel and trucks in the background.

Wide range of opportunities available to mining engineers

Mining Engineering is the oldest and one of the best established branches of mineral engineering. In an integrated mining company, the responsibility of guiding all facets of the mineral-producing operation is usually given to a mining engineer. Therefore, it is important that a mining engineer have a broad educational background. The mining curriculum at Montana Tech does offer a broad engineering background. In fact, it is the only curriculum at Montana Tech that requires all of the basic courses covered in professional engineering tests. These courses are mathematics, chemistry, physics, statics, dynamics, electrical machinery, fluids, strength of materials, thermodynamics, and engineering economy. Mining department courses are designed to provide application of basic engineering to mineral industry problems. Considerations important to engineering managers are also offered in mining course work.

That the mineral industry recognizes the advantages and versatility of a broad engineering background is evidenced by the fact that recent mining graduates have been sought after and employed as metallurgical, mineral dressing, and petroleum engineers.

It is intended by the faculty of the mining department that all mining engineering graduates become Registered Professional Engineers. During the tenure of the present mining faculty, all mining graduates who intended to seek employment in the United States have taken and passed the engineer-in-training test which is the initial step in becoming a Registered Professional Engineer.

Because of the importance of the mining engineer to the entire mineral industry, leadership and academic excellence are stressed as evidenced by the fact that many student body presidents and top-ranked graduates are mining department students. A recent top-ranked graduate in mining engineering, Lee Saperstein, was awarded a Rhodes scholarship and will receive a doctorate from Oxford University this spring.

Four mining engineering students test physical properties of rock.

Mining engineering graduates have demonstrated their leadership abilities throughout the world. A partial listing of these graduates who have risen to the position of President or Vice President of their companies follows: William J. Coulter — American Climax Co., Clinton L. Miller — Cia. Minerals Santander, Edward I. Renouard — The Anaconda Co., Allen H. Englehardt — Cerro de Pasco Corp., Frederick A. McGonigle — Canadian Anglo Mining Co., Frank H. MacPherson — Dulany Mining Co., William H. Love — Hecla Mining Co., Joseph A. Wiendl — Ingersoll-Rad Co., Claude O. Dale — Eagle-Pitcher Co.

To encourage academic excellence, four cash scholarships, ranging in value from $400 to $1,000, are awarded annually to students in mining engineering.

Continued formal education beyond the bachelor's degree is recommended and more than 50% of recent mining graduates have entered graduate school. The availability of many research projects has permitted an active graduate program in the Mining Department. Current research is being done in the areas of rock mechanics, heap leaching, grouting, and computer simulation.

Many mining graduates maintain that much of the credit for their success in industry should go to their education at Montana Tech. Further, they believe that the close proximity of the Butte mines for field trips, employment and research projects was a significant factor in obtaining a well-rounded education.

Many varied opportunities are available to current mining engineering graduates. For those who wish to develop an engineering specialty, there are opportunities in materials handling, rock mechanics, environmental control, power distribution, planning, mine design, mapping, sample control, surveying, and safety and cost analysis. Many new mining graduates recognize very quickly that they have managerial ability and they go into production management. It is from management positions that top executives are usually selected.

There is a great demand for research engineers in the mineral industry. Most research is performed by colleges, and state and federal mining bureaus as well as equipment manufacturers.

A few recent graduates have taken positions as sales engineers with manufacturing concerns. This is very rewarding work for those who enjoy travel and meeting people.

For those who are academically inclined and are interested in obtaining advanced degrees, there are positions available in education.

Because of their broad background, mining engineers are widely sought by other industries. This is one reason for the current shortage of mining engineers in the mineral industry.

Starting salaries for 1967 mining graduates will average slightly over $775 per month. Because of the general shortage of engineers and rate of expansion within the industry, advancement is rapid.

For those who are capable in techniques of communications, mathematics, and the physical sciences and truly enjoy action, a career as a mining engineer will include both exciting challenges and gratifying rewards.

These men are dwarfed by an 85-ton truck. Such equipment helps mining engineers cut mining costs and expand operations.

Featured in this issue's spotlight are Dianne Martin and Angus Hemp. Dianne enjoys discussions with friends and often debates issues in the SUB. Lab experiments have become a common experience for Angus Hemp who has many scheduled with his classes.

Dianne Martin, Angus Hemp featured

Dianne Martin is a freshman general student at Montana Tech. She plans to transfer to Bozeman next year to major in pre-medicine.

Before coming to Montana Tech, Dianne was in the Air Force for three years. She also worked as a receptionist for an optometrist for two and one-half years, and she worked as a reservation sales agent for Northwest Airlines in New York City for one and one-half years.

Dianne really likes Montana Tech because she feels that the students and faculty members are all so friendly. Also, she thinks that the school is small enough that you are able to get to know the faculty members. However, Dianne feels that the administration should be more vigorous in promoting the school. She thinks that the school is lacking in school spirit.

Dianne likes most sports, but bowling, waterskiing and photography rate high on her list.

Angus Hemp, a senior at Montana Tech, will graduate with degrees in both Mining Engineering and Geological Engineering this spring. This semester he is taking courses in the humanities, geology, and mining. He previously attended the University of Witwatersrand in Johannesburg, Republic of South Africa, taking courses in mining engineering for two years. In 1964, as a recipient of the O'Okiep Copper Company Overseas Scholarship, he transferred to Montana Tech to take up his present studies. While at Montana Tech, he has received the American Refining and Smelting Company Scholarship and the Advanced Honors Scholarship.

For the past two summers, and for one day a week during the school year, Angus has worked for the Anaconda Company as an assistant research engineer in their Mining Research Department. He will also be employed by the Anaconda Company this summer before returning home. Then he will work for the O'Okiep Copper Mining Company of Namaqualand, Republic of South Africa, a subsidiary of Newmont Mining Company.

Angus and his wife, Frances, a clinical psychologist who formerly worked for the Butte School District, enjoys life in this country, particularly in Montana, which Angus says is a great outdoor state. Although he is experiencing a broadening of outlook here, he feels the university he previously attended was probably better than Montana Tech; after all, it served a city of two million people. On the other hand, facilities and equipment here are more accessible. Also, school life here is more relaxed. School in the Republic of South Africa was conducted differently than here, so it is difficult to make many comparisons, but the work load there would be equivalent to a 30 credit load here. Finally, by attending Montana Tech, he has an opportunity to work in the mines and gain practical experience in the field he is studying for.

Angus is amused at the distorted attitudes people at school have about his country. For example **Daktari** doesn't portray Africa as it really is. Also, he "wasn't sent here by his government to learn what this prosperous country has to teach him so he could go back to help his half-starving brothers." His "brothers" aren't starving at all.

Wesley Foundation reorganized at Tech

The Butte Wesley Foundation was reorganized on the Montana Tech campus at the beginning of the 1966 school year. The new officers elected are Doris Hanpa, president; Jack Marjerison, vice-president; Carol Fanning, secretary; and Joan Moyle, treasurer. The new counselor is Rev. Robert Link.

Last semester there were series on the Viet Nam War and Love and Sex. Sgt. Stern of the Marine Recruiting Office and Richard Shaver, a student here at Tech, spoke on their tours of duty in Viet Nam. Various reports were given by the members and films presented with the Love and Sex series.

Planned for the second semester are series on drugs and the problems created by them, what your future boss will expect of you, and an insight into the world of marriage. Some guest speakers who will speak to the group on the above topics are Mr. Leo Maney, Mr. Thomas Lester, Mr. Edgar Henderson, and Rev. Marion Hixson.

The group is also planning to present a full length motion picture on April 21 at the Aldersgate Methodist Church.

Bashful Tech students called for pictures

Students who wanted to have their pictures in this year's issue of the Magma were to have their photographs in by Friday, March 31, the final date for the pictures. The names of the students who had not yet submitted pictures were published on the bulletin board in the Student Union Building. Pictures were to be brought to Professor Young's office on the first floor of the Petroleum Building.

Bond's Eye View

Some of the veterans of the residence hall wonder why our Charles Russell original hasn't been returned to our campus. Anybody know why?

* * *

Did you know that the Z-T ski school includes two fellas and a wolf? And that the leader of the ski patrol is too tight to buy his girl friend lessons in skiing? (Could be some other reason, too, so I better not make any more comments)

* * *

Spring is definitely here. There are kites hanging from almost every electric wire and tree in town.

* * *

I found out that there is something worse than Lysurgic Acid Diethylamide (LSD)—it's skiing!

* * *

'tis spring, and a young man's fancy turns to thoughts of fishing, hunting, camping, field trips, and playing hookey.

* * *

'M' day is coming up. Actually it is not set up to be just a big beer-bust, it is a day set aside to let us students clean up our campus and paint the M and make the people of Butte have just a little more pride in having one of the best engineering schools in the nation in their city.

600 summer jobs open in Montana

Over 600 summer jobs around Montana in 55 state agencies and 7 Indian agencies will be available under the college work-study program, according to Victor Burt, Tech business manager.

These 40 hours-a-week jobs range over a variety of occupations, some requiring special training, some not. A complete list will be posted in the SUB.

Some work will also be available on the Tech campus.

Students must be regularly registered in one of the 11 universities, colleges, and junior colleges in Montana and must meet the work-study eligibility requirements.

The program is being administered by the Montana Compact on Financial Aid, an organization made up of the finance officers of the various universities and colleges.

Interested students should inquire at the business office without delay. The deadline is May 1, but early registrants may have more choice of work, Mr. Burt remarked.

Tech faculty members and students are participating in beryllium project

How beryllium might be produced in a more ductile state than is possible in commercial processes now used is one of the current projects of the Metallurgy Department. The process being worked on makes use of a mercury cathode. A possible advantage of a mercury cathode over a solid cathode is that the mercury may retain some of the impurities, leaving a pure beryllium product. When the mercury is filtered these impurities remain in the mercury leaving purer beryllium than is possible with a solid cathode. Another foreseen advantage of the new method is that the beryllium can be produced continuously at a lower operating temperature and with a minimum number of steps. This process is going forward with consultations from Dr. B. Kopelman, the inventor of the new method.

A fused mixture of $BeCl_2$ and NaCl is electrolized with a mercury cathode and a carbon anode. The beryllium collects at the cathode and forms an amalgam with the mercury. The amalgam is then pressed and distilled leaving high purity beryllium powder. The small grains of powder, when consolidated, form ductile beryllium.

Prime contractor for this research is the General Astrometals Corporation with the Montana Tech Metallurgy Department as a sub-contractor. Members of the Tech faculty working on the research are Dr. Vernon Griffiths and Dr. Fathi Habashi. The project is being financed by NASA. The Extractive Metallurgical Research Division of the Anaconda Company is lending assistance in the use of its lab. Program manager is Mr. G. T. Hanson of the General Astrometals Corporation. The Anaconda Company has also loaned one technician, Mr. P. Moses, for assistance in the project. Also assisting is Mr. Kling, who has been hired by the school. Graduate students who are helping in the project are Robert W. Toivonen (who just finished his thesis), Abdel H. Hussein, and L. V. P. Raman. Consultations are made with Mr. W. G. Lidman, Technical Director of General Astrometals Corporation.

The production of the beryllium goes on at Anaconda while evaluations of the finished metal are made in the Tech metallurgy lab. The methods of evaluation include X-ray diffraction, electron microscopy, and X-ray fluorescence.

L. V. P. Raman, a graduate student from Madras, India, demonstrates the low density of beryllium. The large beryllium object on the left weighs less than the small brass weight. In fact, beryllium is lighter and stronger than aluminum.

Anonymous Tech students are thanked

AN OPEN LETTER TO TWO MONTANA TECH STUDENTS

On Monday, March 6, I was attempting to walk and catch my bus to work, but it was noontime and during the most awful wind and snow storm I've ever experienced in Butte. I couldn't see in any direction so I turned to grope my way back home.

I was holding onto fences on Marcia Street when a couple stopped to see if they could help! I was delighted to see anyone and this nice young couple wound up taking me all the way to St. Mary's to work.

I'm sure they were on a lunch hour and all I learned was that they went to Montana Tech. The rest of the time I spent thanking them.

Now I hope they'll read this so I can openly express my gratitude to two young people for a truly out of the way kindness.

Please know that you're appreciated far more than I can say and thank God for young people like you.

Mrs. Grace La Chambre
1904 Florida
Butte, Montana

Draft changes made

(continued from page 1)

must be judged on their individual merits, would continue to be granted.

The commission said that no issue "received such prolonged and thorough deliberation" as student deferments. But it said, "On one basic conclusion the commission is in full agreement: deferments should never be allowed to become, in effect, exemptions. All commission members agree that one of the gravest inequities in the present system of deferments is that what starts out as a temporary deferment for college enrollment is easily extended into a de facto exemption—by graduate school, by occupation, by fatherhood, and ultimately by the passage of time and advance of age. . . There is no evidence in the opinion of most members of the commission, that the abolishment of student deferments would deter young men selected for service from going to college, or returning to college when their service was completed. This being so, the actual effect of student deferments, as these members see it, is unrelated to the national interest. Quite to the contrary, they believe, student deferments have become only a convenient device to shrink the ever-increasing pool of available manpower."

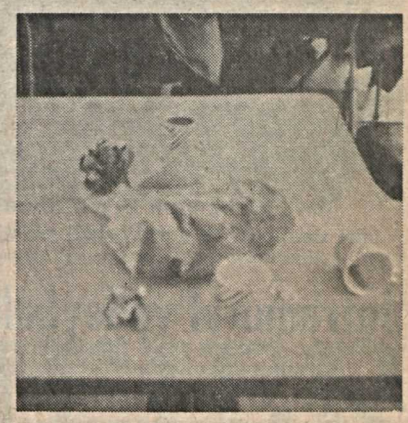
Mineral Dressing presents seminars

The Department of Mineral Dressing for the second semester is holding their seminars in Metallury 115 at 4:00 p.m. at certain designated times.

Those talks already given were "Analog-Digital Instrumentation for Streaming Potential and Streaming Current Data" by Samuel Higinbotham on February 23, 1967, "The Theory of the A.C. Properties of Low-Conduction Dielectric Material" by William Lehfeldt on March 2, "Design and Analysis of Factorial Experiment" by Raymond Hyyppa on March 9, and "An Investigation of Aggregate-Asphalt Adhesion by Measurement of Heats of Immersion" by Henry Schulz on March 16.

Talks still to be presented:

Robert Beers — Topic TBA ..... April 6
Robert Frantz — Topic TBA ..... April 13
David Duncan — Processing of a Silver Ore ..... April 20
Patrick Dooley — Flotation of Molybdenite ..... April 27
Joseph Young — Topic TBA ..... May 11
TBA—to be announced



Some students either don't read signs or can't understand them. They seem to be poor college material.

Finagle's Laws on experiments presented

In a previous issue of the **Amplifier**, the Finagle Factor of Finagle's Laws was presented. In this issue Finagle's Laws themselves are introduced.

ON EXPERIMENTS

The first four laws are the only ones dignified by number. Note the beauty and simplicity of the First Law. Also note that the remaining three laws refer to men's reactions to Nature—not to Nature itself.

First Law: If anything can go wrong with an experiment, it will.

Second Law: No matter what result is anticipated, there is always someone willing to fake it.

Third Law: No matter what the result, there is always someone eager to misinterpret it.

Fourth Law: No matter what occurs, there is always someone who believes it happened according to his pet theory.

The Law of the Too Solid Goof:

In any collection of data, the figure that is most obviously correct—beyond all need of checking—is the mistake.

Corollary I—No one whom you ask for help will see it, either.

Corollary II—Everyone who stops by with unsought advice will see it immediately.

A further series of rules—or really advice to experimenters—has been formulated. They are a natural consequence of the first four laws reduced to day-to-day practice.

Experiments must be reproducible—they should all fail in the same way.

First draw your curves—then plot the readings.

Experience is directly proportional to equipment ruined.

A record of data is useful—it indicates you've been working.

To study a subject best, understand it thoroughly before you start.

In case of doubt, make it sound convincing.

Do not believe in miracles—rely on them.

Always leave room to add an explanation when it doesn't work.

(This open door policy is also known as the Rule of the Way Out.)

Finagle's Creed:

Science is Truth, don't be misled by facts.

Finagle's Motto:

Smile—tomorrow it will be worse.

—IRE Student Quarterly

Dolly LaBranche speaks at Tech

"The Electron Microscope" was the title of the lecture that Dolly LaBranche of the Westinghouse Electric Corporation gave at the meeting of the American Society for Metals, March 9. The talk was about the use of an electron microscope to find what was causing the brittleness in irradiated steel. Slides were given along with the talk.

Miss LaBranche was the first woman graduate to get a degree in Metallurgy at Montana Tech. She graduated in 1966 and now works for Westinghouse.

After her talk Miss LaBranche answered questions concerning what she did after graduation and how she got the job she now holds.

DOLLY LaBRANCHE

Dean Stolz talks at Wyoming meet

Gustav Stolz, dean of student affairs, gave a talk March 8 at a meeting of the Big Horn Basin section of the American Society of Petroleum Engineers. The meeting took place in Cody, Wyoming.

Dean Stolz spoke on "Continuing Eduction." He discussed the organization and development of a continuing education program in the Billings Section of the S.P.E., a program on reservoir engineering scheduled to conclude on May 5.

A lively question and answer period followed the talk. Most of the questions were related to the possibilities of setting up a similar program in the Cody region.

Dean Stolz and Dr. Herbert Warren have alternated in lecturing to the Billings group.

EIT review sessions are being held

Montana Tech engineering students and graduate engineers residing in the Butte area are taking evening review sessions on engineering fundamentals in preparation for registration as engineer-in-training (EIT). These review sessions, sponsored by the Butte Chapter of the Montana Society of Engineers, began March 10 when Professor Catenaro conducted a session in mathematics. Other sessions that have been held are Statics by Professor Herndon, Dynamics by Professor Herndon, Chemistry by Professor Ensley, Fluid Mechanics by Professor Young, and Physics by Professor McCaslin.

Sessions still to be conducted are Mechanics of Materials, April 5, by Professor Stout; Thermodynamics, April 10, by Professor Herndon; Electrical Theory, April 12, by Professor Young; and Economic Analysis, April 17, by Professor Van Matre.

The sessions are being held from 7:30 to 9,30 P. M. in Room 10 of the Physics-Petroleum-Engineering Science Building.

Jim Ficklin, Tom Green (front), Joe Smith and Bob Marvin (back) take time out for a volleyball practice session in the gym.

Intramural volleyball is now in action

Intramural volleyball began March 1, at 7:00, when the Graduates were defeated by Theta Tau.

The winning teams up to and including March 14, were: Theta Tau, Spikers, Ptombzl Bombers, Tapakegabrew, Graduates, Obituaries, Faculty, and Engineers 11.

Coach Lester has announced that at least twenty-eight games will be played from March 1 to April 5, with the top teams competing in an organized tournament with awards going to the top teams.

The teams will continue playing until April 5 and then the top teams will participate in the tournament to be played shortly after.

Later results will be published in the next issue according to the volleyball schedule listed below.

March 1	7:00	Graduates vs. Theta Tau
	8:00	Spikers vs. Supermen
March 6	7:00	Ptombmzl Bombers vs. Volley Dolley
	8:00	Tapakegabrew vs. Water Boys
March 7	7:00	Graduates vs. Faculty
	8:00	Spikers vs. Engineers 11
March 13	7:00	Ptombmzl Bombers vs. Theta Tau
	7:30	Tapakegabrew vs. Supermen
	8:00	Graduates vs. Volley Dolly
March 14	7:00	Volleyball Team vs. Faculty
	7:30	Water Boys vs. Engineers 11
	8:00	Spikers vs. Obituaries
March 15	7:00	Volleyball Team vs. Theta Tau
	7:30	Water Boys vs. Supermen
	8:00	Tapakegabrew vs. Engineers 11
March 27	7:00	Theta Tau vs. Volley Dolly
	8:00	Supermen vs. Obituaries
March 28	7:00	Graduates vs. Volleyball Team
	7:30	Faculty vs. Ptombmzl Bombers
	8:00	Spikers vs. Water Boys
March 29	7:00	Ptombmzl Bombers vs. Volley Dolly
	8:00	Tapakegabrew vs. Obituaries
April 3	7:00	Ptombmzl Bombers vs. Graduates
	8:00	Tapakegabrew vs. Spikers
April 4	7:00	Faculty vs. Theta Tau
	8:00	Engineers 11 vs. Supermen
April 5	7:00	Volley Dolly vs. Faculty
	8:00	Obituaries vs. Engineers 11

Gary O'Farrell and Jerry Trythall take advantage of the weather as Gary takes his turn as umpire and Jerry utilizes the catching position.

Baseball, intramural softball planned

Baseball

Varsity baseball will soon begin its playing season sometime in early April. Baseball practice is now in progress for those participating.

The players who will be chosen to comprise the Tech team will be published in the next issue.

Softball

Intramural softball will begin play as soon as intramural volleyball has been completed as announced by Coach Lester.

Each admitted team will play the other participating teams at least once with a tournament to be held for the top teams.

All those who are interested are to turn in a team roster to Coach Lester as soon as possible.

Track in full swing

The Montana Tech track team, with its practice sessions started on Feb. 27, has begun preparations for the coming track session in which Tech hopes to participate in at least three track meets.

Most of the trackmen have already reached top competitive condition but some are just starting the track workout. Coach Lester has announced that he is very strong in the distance events and the sprints, but it weak in the field events.

Those men participating in the track events are the following: 100-yard dash—Lee Staiger, 220-yard dash—Lee Staiger; 440-yard dash—Frank Koskimaki, Jim Ficklin, and Les Ocks; mile run—Les Ocks, Chuck Dickerson, Pete Young, Chris Croff, and Dave Margolin; 2 mile run—Steve Dobb and Pete Young. Relay—Frank Koskimaki, Lee Staiger, Joe McManus, Jerry Trythall, and Dave Margolin; broad jump—Lee Staiger, Jerry Trythall, and Steve Dobb; high jump—none; pole vault—Lee Staiger and Dan Piazzola; hurdles, shot put and discus as of yet are vacant. Coach Lester hopes that more of these vacancies will be filled. All those who still wish to participate in track are to notify Coach Lester as soon as possible.

Intramural handball begins, golf to start

Handball

Intramural handball got underway early in March with thirteen teams participating in double league play. Of the thirteen teams, eight already moved into the top sixteen bracket. These are Craig Bartels, Fred Hoffman, Dan Sebena, Jim Benney, Carl Ryan, Brad O'Neill, Terry Angove, and John Sutey.

When the other eight players have also reached this top sixteen bracket, they will each be able to compete for the top eight, the top four, until the two top teams are recognized for the championship.

Golf

Intramural varsity golf practice began Monday, Feb. 27, with those wishing to compete already in practice.

Regular playoffs have not yet been anounced but it is hoped they will be in the near future.

All those interested are to contact Coach Lester as soon as possible.

Further information on golf and intramural handball will be published in the next issue.

Prosperity is something that business men create and politicians take credit for.

Prominent figures on the ski slopes at Z-T are (from left to right) Haskel Lobb, Bob Hanson, Don Wilson, and Joe Wallace. (Photo by Ernie Bond)

For more enjoyable skiing—

The task of the Ski Patrol, which is unpaid, is to enforce skiing regulations, block off dangerous areas, and to help anyone who is hurt or all tangled up in his skis. Such is the task accepted by Joe Wallace, assistant patrol leader of the Z-T Ski Patrol, and the other seven regular and four junior members of the patrol. Joe, a sophomore in geophysics, has been skiing for six years and is fortunate in that he lives only four miles from the Z-T. According to Joe, the ski patrol will be affiliated with the National Ski Patrol next year. Requirements for regular membership include skiing ability, an advanced Red Cross first aid card, eleven hours of on-the-hill training, pass the National Ski Patrol test, and be 18 or over.

To make skiing more enjoyable from beginner to expert, certified instruction is available at the two-year-old Z-T ski school. The certified professors of skiing are Don Wilson, freshman in Geology; Bob Hanson, freshman in Mining; and Haskell Lobb, freshman in Math. Actually from their comments, they are all majoring in skiing and enlarging the facilities of the Z-T. Don and Bob, skiers for six years, attended an instruction clinic in Brighton, Utah, last year, and all have gone through the instruction clinic at Deep Creek (near Wisdom) this year. Both clinics were to give instructors advanced training in the American Ski Technique, which is taught at almost every ski area in the U. S. Instruction fees are 1.75 per person in a group lesson and $3.50 for a private lesson.

The Z-T is located 16 miles southeast of Butte on U. S. 10 on the northern side of Toll Mountain. The area has a beginner's slope with a 700-foot rope tow and a 300-foot vertical drop, an intermediate slope with an 1800-foot vertical drop and next season will be serviced by a 3000-foot T-bar.

Future plans include a 7,000-foot chair lift from the bottom to the top of Toll Mountain, overnite accommodations, several chalets, more poma lifts, helicopter service into to the highlands, a ski shop, an olympic size skating ring, and a luge run (a one-man toboggan, luge).

The ski area is owned by five Wilson brothers who make up the Z-T corporation. All the area and equipment design was done by Bob Wilson who obtained his Bachelor and Master of Science degree here at Tech. He is now Chief Engineer for the Galliger Corp, at Salt Lake City, Utah.